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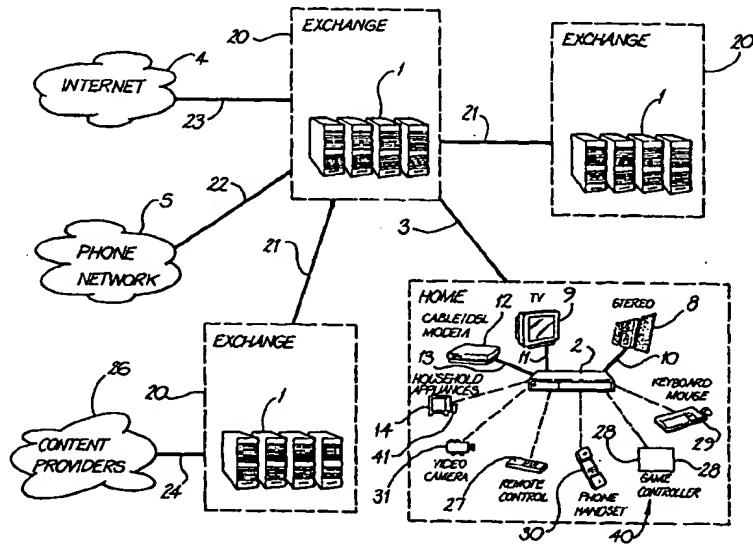
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(54) Title: COMMUNICATION SERVICE SYSTEM AND METHOD



(57) Abstract: The present invention relates to the provision of multiple communication services, particularly to a domestic environment. Telecommunication services including telephone, data, cable are usually provided by different providers utilising different infrastructures, often requiring complex hardware to be provided in the home. The present invention provides a system including a server computing system for providing all the communication services, including audio, TV, data, video, via a remote unit which includes minimal processing hardware to carry out format conversion. All control and decision making take up the computer server. This simplifies the hardware required in the home and improves stability of communication services.

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COMMUNICATION SERVICE SYSTEM AND METHOD

Field of the Invention

The present invention relates to communication services, and particularly, but not exclusively, to a multi-service communication service system and method.

Background of Invention

Presently, a number of different communication services are provided for home and business users. These include telephone communications, television and radio broadcasts, data communications (computer networks). These services provide the ability for voice communications, person to person and business to business, enable video communication information to be broadcast together with audio information (TV), allow interactive video conferencing and enable data to be communicated between users. Generally, the systems infrastructure for providing these services is separate for each service. Separate hardware is usually required to transmit and receive each of the services.

To the home, for example, a telephone system is provided for voice communications. A separate television network is provided for wireless television communications (or where cable is available, a cable or satellite system is provided for video and audio, again using a separate network). Data communications may utilise the telephone network, but separate hardware is provided to interpret data signals (computer and modem) from the telephony hardware. Radio broadcasting networks require other hardware and transmission networks.

The provision of all these separate infrastructures and devices for providing each communication service is complex and expensive for the provider and the user.

Further, many of the communications services provided to the home or business rely upon complex functionality being provided by hardware and software which is on-site

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(i.e. in the home or in the business). The hardware and software required will need to have enough processing ability to make intelligent decisions regarding the processing of the data required for implementing the 5 communications services.

Cable or satellite television, for example, requires a relatively complex "set-top" box to be provided on-site at the user end. These set-top boxes include relatively complex circuitry, which must have decision making 10 capability to enable the service to function. This is expensive for the service provider (with most cable and satellite TV systems the service provider maintains ownership of the set-top box even where it is located on-site). The hardware is also difficult to maintain as it 15 is distributed to many sites. It can also be relatively complex for the consumer to use.

Further, with general data processing systems such as computers, much of the hardware in the systems is distributed (a home user will have a computer on site 20 including complex circuitry, disk drive, etc. which stores the majority of their software requirements and requires a significant amount of processing power to function). Again, the distribution of all this processing power means that maintenance is required at the user end and it is 25 expensive for the user to purchase and maintain the computing device. Further, home computing devices are very difficult to operate and expensive to maintain. Often an unknowledgeable user will need to take a PC to an engineer even just to carry out simple tasks such as 30 installing and maintaining software.

Further, there are many home and business requirements which are not presently provided by any communications service, and are solely provided by hardware at the business or home location. These include 35 video games devices, compact disk players, DVD's, VCR's, etc, all of which require decision making intelligence in the form of processing power, to function. Purchase and

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maintenance of all the devices required to meet these requirements is a significant cost.

Another problem with the majority of these requirements, whether they be provided by communications 5 servers together with hardware on site, or are provided totally by hardware on-site, is that in order to carry out upgrades or modifications, it is usually necessary to modify or in some cases even replace the hardware which is on-site. This is an on-going and significant expense.

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Summary of the Invention

The present invention provides a system for providing a plurality of communication services to a remote user, comprising a server computing system including processing 15 means for processing a plurality of communications services and transmission means for providing the communications services over a transmission link, and a remote unit located remotely from the server computing system and including receiving means arranged to receive 20 the communications services over the transmission link and pass the communications services to remote user devices, and transmitting means for transmitting control signals for controlling and selecting communications services to the server computing system over the transmission link, 25 wherein processing of the control signals and consequent control and selection of the communications services takes place at the server computing system, not at the remote device.

The term "communications services" includes any data 30 services that can be provided by way of a communications link, and these include video data services (so that video can be provided to the remote user as a service), audio, information data, control data, voice communications data (e.g. for telephone communications), video communications 35 data (e.g. for video conferencing) IP based data service (e.g. providing access to the Internet), and others. Preferably a number of these communications services are

provided by the system.

The remote unit preferably includes no or minimal decision making capability. All or the majority of decisions (decision making processing) are made by the 5 server computing system. Preferably, the remote unit is arranged to carry out format conversion, ie the conversion of data from one format to another (transmitted digital data to analogue video data, for example). Format conversion is not a decision making process. The remote 10 unit may be able to carry out some minimal decision making processing, but, preferably the processing which is provided by the remote unit is only format conversion.

Preferably, the remote unit includes no decision making capability and all the decisions (decision making 15 processing) are made by the server computing system.

Preferably, the communications service is transmitted via a data signal and the required conversion steps are applied to the data signal by the remote unit in order to utilise the data signal to provide the communications 20 service. The remote unit is preferably merely a "port" which requires minimal processing power. The remote unit, for example, may include a means for converting a digital video signal to a video signal for driving a CRT; a means for passing on an audio signal already configured 25 to drive an audio amplifier; means for passing on digital control signals, means for passing on IP-provided data, etc. The data signal received over the transmission link is preferably in a form that can be used by a remote user device or only requires minimal processing (e.g. digital 30 to analogue conversion) to be used by the remote user device.

Processing is done at the server computing system to such an extent that even control signals for controlling and selecting communications services are transmitted to 35 the server computing system for processing. For example, if a remote user wishes to change a TV channel that they are viewing on free-to-air TV which is being provided as a

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service via the communications service, the control signal for changing the channel is provided to the remote unit which merely transmits it on to the server computing system. The server computing system then makes the 5 channel switch and transmits the video and audio data for the TV channel to the remote unit.

Preferably, the transmission link is a broadband link, taking advantage of the availability of broadband facilities in order to be able to transmit large amounts 10 of preferably digital data over the link. This, again, reduces the need for processing at the remote user end.

In this system, therefore, the majority of processing (and all decision making) may be carried out by the server computing system. A service such as TV or H-definition 15 TV, quality video, high-fidelity quality sound, voice quality sound, digital control signals data and data may be provided as the communication services by the server computing system and essentially "piped" down a broadband link to and from the remote unit, which acts essentially 20 as a conduit, requiring minimal processing power, to pass the "piped" signals through to the end-user device such as the television, speakers, telephone set, etc.

Note that the link need not be a broadband link.

Slower data links e.g. narrowband such as a modem 25 connection could be used where the communication services that are provided do not require a broadband connection. For example, radio quality sound would fit over such a narrowband link.

An arrangement according to the present invention has 30 a number of advantages. Any adaptations that are required in the system in order to change the services or the quality of services can all be done at the server computing system end. It is therefore not necessary for the end user to make changes to the remote unit. The 35 server computing system may serve many remote units, and provide different services to each, depending upon the requirements of the particular remote user. The remote

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unit preferably has a minimal amount of hardware and processing power, requiring minimal maintenance and replacement costs. As the majority of the processing power and expense is with the server computing unit, the 5 service provider having control of the system does not have to worry about maintaining large amounts of hardware at distributed locations that may not be easy to access. It also facilitates the provision of rented communications services (eg renting services monthly) rather than having 10 to purchase a service facility outright.

A further advantage of a system in accordance with the present invention is that it provides de-facto protection of copyright for digital material being transmitted from the server computing system. Because, 15 preferably, a remote unit includes no or minimal decision making capability, preferably it does not have the capability of recording and storing the signal for later reproduction. The signal transmitted from the server computing system therefore cannot, preferably, be stored 20 by the remote unit and copied.

Preferably, the system is arranged to provide communications services to homes or businesses.

Preferably the system is arranged to provide communications services to the home.

25 Preferably, the system can be used for the control of remote user devices that are not merely the conventional remote user communication service devices. In the domestic environment, for example, the system may be used to control domestic devices such as microwaves, ovens, 30 cookers, washing machines, dryers, and any other domestic device. Preferably, the system includes controller devices which are arranged to receive control instructions from the server computing device via the remote unit and are interfaced with remote user devices, such as 35 microwaves, cookers, etc to control them. A remote user could, therefore, for example, advise the server computing system what devices he wishes to be controlled, how and

when, and the server computing system will take the necessary action at the appropriate time, e.g. switch on an oven at a time designated by the remote user. Further, information can be obtained over the transmission link 5 from the remote user devices to, for example, enable a user to be advised of the status of their household devices, perhaps via a Web page and Internet link to the server computing system.

Preferably, the server computing system is connected 10 to the Internet, (or any other public access computer network) so that the remote user can instruct the server computing system over the Internet to control remote user devices, and can also obtain information (eg via a Web page) on the status of the remote user devices.

15 Preferably the server computing system is also arranged to be connected to other communication networks such as a telecommunications network, to enable the provision of telephonic and other communication services.

The system preferably includes control devices which 20 are arranged to provide control signals to the server computing device via the remote unit. The control devices may include remote controls (for TV/VCR communications services), games controllers (for video games communications services), a keyboard and mouse and 25 other computer interface facilities for controlling computing communication services, etc.

The system of the present invention is preferably able, therefore, to provide a full range of communication services to the home, including conventional 30 communications such as telephone, TV, video, audio, and data, and communications services providing other services, such as controlling devices in the home, providing video games, etc.

The present invention further provides a system for 35 providing a communication service to a remote user, comprising a server computing system including processing means for processing the communications service and

transmission means for transmitting the communications service over a transmission link, and a remote unit located remotely from the server computing system and including receiving means arranged to receive the

5 communications service over the transmission link and pass the communications service to remote user devices, and transmitting means for transmitting control signals for controlling the communications service to the server computing device over the transmission link, wherein

10 processing of the control signals and consequent control of the communications service takes place at the server computing system, not at the remote device.

This aspect of the present invention may have any or all of the features of the aspect of the invention

15 discussed above.

The present invention yet further provides a system for providing a plurality of communications services to a remote user, comprising a server computing system including processing means for processing a plurality of

20 communications services and transmission means for transmitting communications services over a transmission link, and a remote unit located remotely from the server computing system and including receiving means arranged to receive the communications services over the transmission

25 link and pass the communications services to remote user devices.

This aspect of the present invention may have any or all of the features of the aspects of the invention discussed above.

30 The present invention yet further provides a system for remotely controlling domestic devices, comprising a server computing system including processing means for processing instructions for controlling domestic devices, transmission means for transmitting control instructions

35 for controlling domestic devices over a transmission link, at least one controller device associated with a domestic device and being arranged to cause control of the domestic

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device in accordance with the control instructions, and a remote unit located remotely from the server computing system and including receiving means arranged to receive the control instructions over the transmission link and 5 pass the communications services to remote user devices.

The domestic devices that may be controlled by the present invention include lights, cookers, microwaves, VCRs, and any other domestic device. These devices located in business premises are also included.

10 Preferably the system of this aspect of the present invention may include many remote units and the system may be arranged to control domestic devices at many remote locations.

15 Preferably, the system of this aspect of the present invention may provide other communications services, and may have any or all of the features of the above aspects of the present invention.

20 The present invention yet further provides a system for providing a communications service to a remote user, comprising a server computing system including processing means for processing the communications service and transmission means for providing the communications service over a transmission link, and a remote unit located remotely from the server computing system and 25 including a receiving means arranged to receive the communications service over the transmission link and pass the communications service to remote user device, wherein all or the majority of decision making processing occurs at the server computing system, and not at the remote 30 unit.

35 Preferably, all the decision making processing is carried out by the server computing system.

35 Preferably, the remote unit is capable of format conversion, and preferably is only capable of format conversion.

35 Preferably the system is arranged to provide a plurality of communications services.

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The system of this aspect of the invention may include any or all of the features of the aspects of the invention discussed above.

The present invention yet further provides a system 5 for controlling user devices remotely, the system comprising a server computing system including processing means for processing control signals from the user, and transmission means for transmitting a control signal over a transmission link to the remote user devices, the server 10 computing system being connected to a computing network whereby the user can provide control signals to the server computing system via the computing network for controlling the remote user devices.

The remote user devices can be any remote user 15 device, such as VCRs, DVD players, video recorders and any other domestic device as discussed above. Preferably, the computer network is the Internet, and the user can instruct the server computing system via the Internet, e.g. via a web page, to provide control signals for 20 controlling the user devices, which may be in the users home or business.

The present invention further provides a method of providing a communications service to a remote user, comprising the steps of providing the communications 25 service to the remote user over a transmission link from a location remote from the remote user, and carrying out all decision making processing relating to generation of the communications service at the remote location.

Preferably, the method includes the step of carrying 30 out signal format conversion for the communications service at the remote user location.

Preferably the method includes the step of providing a plurality of communications services.

The present invention further provides a remote unit 35 as discussed above, for use with the system as discussed above.

The present invention also further provides a server

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computing system as discussed above, for use with the system as discussed above.

The present invention further provides a control device as discussed above, being arranged to provide 5 control signals to the server computing system, for use with the system as discussed above.

The present invention further provides controller devices as discussed above, for controlling remote user devices in response to signals from the server computing 10 system, for use with the system as discussed above.

The present invention further provides a system for providing a plurality of communication services to homes or businesses, comprising a server computing system located remotely from the homes or businesses and 15 including processing means for processing a plurality of communications services and transmission means for providing the communications services to the homes or businesses over a transmission link, and a remote unit(s) located remotely from the server computing system at the 20 homes or businesses and being arranged to operate as a port to pass communications services and control signals for controlling communications services between the remote server and remote user devices in the homes or businesses, the remote unit, as a port, including minimal decision 25 making processing.

Features and advantages of the present invention will become apparent from the following description of an embodiment thereof, by way of example only, with reference to the accompanying drawing, which is a schematic diagram 30 of a system in accordance with an embodiment of the present invention.

Referring to the drawing, a system in accordance with an embodiment of the present invention comprises a server computing system 1 and a remote unit 2 which, in this 35 example is located in a domestic home. Note that the remote unit can be located anywhere, e.g. in a business location. The server computing system 1 and the remote

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unit 2 are connected together by a broadband cable/xDSL link 3 (note that any type of broadband link may be used). In addition to the server computing system 1 and remote unit 2,in this embodiment the system includes a 5 plurality of control devices 40 for providing control signals to the server computing System 1 via the remote unit 2.

The server computing system 1 is arranged to provide communication services via the transmission link 3 and 10 remote unit 2, to the home (in this embodiment). Multiple communication services can be provided by the server computing system 1, and Internet 4 and phone network 5 connections are provided to the server computing system 1 to enable telecommunication connections for voice 15 communication and computer connections to the Internet.

The server computing system is arranged to provide a plurality of communication services to the home. Processing and control (the decision making processing) of the communication services occurs at the server computing 20 system 1. The remote unit 2 merely acts as a "port" passing communications services data through to remote user devices (such as TV 9, stereo 8 and other user devices) in the home. The fact that all applications are run from the server computing system 1 and that the remote 25 unit 2 simply passes signals to and from the home means that the digital services can be added as enhancements and bug fixes can be made with just changes to the server computing system environment. There is no need for a change to the remote unit. This results in a system which 30 is not only very flexible and able to change with the rapid advances of technology, but is also economical to install. Occasionally changes may be made to the remote unit to keep up with changes in technology, but the requirement for upgrade is much reduced with this system. 35 Each of the major components of the system will now be described:

The remote unit 2 is a device that resides at the

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remote site. It has a (preferably continuous) connection to a server computing system 1 over a broadband link 3. The remote unit 2 is the conduit between the devices at the remote site and a network 10 of server computing systems 1 and, via them, the Internet 4.

The remote unit 2 does very little processing, it simply passes signals in both directions between the devices in the home and the server computing system 1. The remote unit 2 includes means enabling format conversion from one signal format to another, but this is all the processing required. There is no decision making processing ability. In this embodiment, the remote unit 2 is configured with the following combination of services and hence ports (Note: however, any configuration of the numbers of channels is possible):

Service	Application	Port type	Num of channels
TV or HDTV Quality video	Video on demand, TV channels, video-conferencing, on-screen display	RF video jack	1
High fidelity quality sound	Audio on demand, radio style services	Coaxial stereo sound plugs	1
Voice quality sound	Intercom, phone, video-conferencing	Wireless feed through to remote unit 2 phone handset as well as speaker and microphone jacks on remote unit 2	2
Digital control signals	Passing on command input from server computing devices 2 and feeding back control signals to controller devices	Wireless signal transmitters and receivers in remote unit 2 to communicate with controller devices	3

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	in the home		
Data	IP-based data service, providing access to the Internet	10/100 Ethernet	1
Broadband connection	Feed communications to and from server computing devices	One of: - 10/100 Ethernet port - RF cable port with built in cable modem - RJ12 port with xDSL converter built in	1

The remote unit 2 is a small simple "black box" which will normally reside with the home entertainment centre, e.g. the stereo 8, VCR (not shown) and TV 9. The remote 5 unit 2 contains, in this embodiment, only the circuitry required to convert signals from the broadband link 3 into an appropriate format for communicating with the remote devices e.g. perhaps from digital to analogue in some cases. There are cable connections 10, 11 with these 10 devices. The system also comprises controller devices 41, which communicate wirelessly with the remote unit 2, or could be wired connection, perhaps through a home LAN for controlling other end user devices (eg household appliances such as microwave 14) in accordance with data 15 provided by the server computing system 1 as a communications service. The controller devices 41 are not shown in detail, but it will be appreciated that they will comprise a means for receiving signals from the remote unit 2 and a means for interfacing with the controls of 20 the end user devices in order to facilitate control of the end user devices. Also shown in the drawing is a cable/DSL modem 12 (note that any type of broadband link could be used) also connected to the remote unit 2 by cable 13.

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The server computing system 1 in this embodiment, is connected in a network of server computer systems 20 which run the programs and have the connectivity to provide the communications services. Remote units 2 are positioned 5 such that all remote users in a particular geographical area will be able to communicate with one another at broadband speeds, via the server computing system 1.

The server computing systems 1 in a region are connected via a broadband WAN connection 21 to provide 10 interserver communications. At one or more points on this WAN are bridges 22, 23 to external networks needed to provide the services including such things as:

- Links 23 to the Internet 4;
- Interconnections 22 with telecommunications 15 networks 5 to provide telephony;
- Connections 24 to specialist service and content providers 26 such as media companies to provide such things as video content.

All the intelligence and interaction of the services 20 is managed at the server computing system 1. Control signals for controlling and selecting the communications services are simply fed through by the remote unit 2 from the control devices 40 and the server computing system 1 running the service reacts accordingly and resultant 25 output (in the form of data providing the communications service) is fed back to the remote user devices via the remote unit 2.

For example, if a remote user of the system wishes to 30 watch free to air television, a communications service providing the free to air television is transmitted digitally from the server computing system 1 to the remote unit 2, in the form of data including video information and audio information corresponding to the selected free to air television broadcast. The remote unit 2 includes 35 means for converting the video information data to a video signal to be displayed on a particular tuned channel on the user's TV 9. Audio data is converted by the remote

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) unit 2 to a signal suitable for driving an audio amplifier for driving the speaker of the TV 9. The remote user devices 8 include a remote control module 27. If the user presses a button on the remote control module 27 in order 5 to change the free to air TV channel, this is emitted wirelessly by the remote control module 27, received by the remote unit 2 and fed straight through to the server computing system 1 as control data. The server computing system 1 responds to the control data by locating the TV 10 signal for the selected free to air channel and transmitting video and audio data corresponding to the selected free to air broadcast down the broadband connection 3 to the remote unit 2, from which it is passed on in suitable form to drive the TV 9. Thus a channel 15 change is achieved with all the processing occurring at the server computing system 1 end.

To add services to the system or to allow a user to subscribe to additional services simply requires activity at the server computing system 1 end. The hardware in the 20 home remains unchanged.

The system is arranged to provide multiple communications services down the same transmission link 3, so that the remote user can select between many different communications services.

25 As the server computing system 1 is networked to the Internet, the system is arranged so that the remote user is able to control their services via Internet web pages as well as directly via control devices 8. The user is therefore able to use an Internet connected computer or a 30 WAP enabled mobile device to control the system as easily as with the traditional remote control.

This has certain advantages:

- 35 it enables more complicated changes of settings. For example, it would allow the presets of the remote control to be programmed from a selection of thousands of channels;

- it means that the system can be controlled from

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) anywhere Internet access is available. For example, 5 a remote user may have a system controller device arranged to control their microwave (see later) and is able to send a signal from their work computer to start it cooking when they set off from work so that it is done when they get home;

- the interface to the system which is run at the server computing system 1 end can be easily enhanced with only changes at the server end. Once again, no 10 hardware changes at the client end are necessary.

Control Devices 40

The system control devices 40 are distinct devices 15 that work in conjunction with the remote unit 2 to provide control input and/or output to the system. These devices communicate wirelessly with the remote unit 2 and have a range such that they are able to remain in contact with the remote unit 2 wherever they may be usefully applied in the house.

20 The devices will be able to be bought separately and activated by the remote user. Some communications services may require a control device to be purchased for access to the service.

Following is a list of some of the control devices 25 that can be provided for the system. This is not an exhaustive list. Other applications may require other types of control devices

Driving system

30 The following control units provide signals to the remote unit 2 for driving communications services.

Simple remote control 27

This is very similar to a traditional TV/VCR remote 35 control. It has a versatile generic set of buttons including:

- a switch to choose modes (applications) such as TV,

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-) stereo, etc.;
- a number keypad;
 - fast forward, rewind, stop, pause, etc.;
 - volume, brightness, contrast, etc.;
- 5 - a set of preset channel buttons;
- a set of keys for application specific functions.
- This controller is used like a normal TV/VCR/Stereo remote control. The remote user selects a mode (application) and then uses the buttons they are used to.
- 10 There are a set of application specific function keys which either change to set actions depending on the application or are programmable by the remote user to provide short cuts. There are also channel presets which the remote user can customise to their preferences. Such
- 15 programming/customising can be carried out through a WAP/HTML session with the server computing system 1, which is configured to enable this.

() Games control unit 28

- 20 This is a control unit for playing video games. It looks and acts approximately the same as traditional games controllers except that it has a wireless connection to the remote unit 2. The server computing system 1 is arranged to provide a communications service which
- 25 provides a video games facility, and the games control unit 28 sends control signals via the remote unit to the server computing system 1 where all processing of games responses to control input is carried out. All that is transmitted over the transmission link is data for driving
- 30 the TV 9 (video and perhaps audio data) to provide the games interface to the remote user. The control unit 28 may also be configured to receive a feedback signal from the remote server computing system, to actuate mechanical transducers on the control device 28 to provide mechanical
- 35 feedback to the remote user.

() Keyboard/Mouse 29

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This is a wireless keyboard/mouse combination which allows operation of a communications service which provides the facilities of a personal computer. A remote users applications and data are stored at the server

5 computing system 1 (appropriate security arrangements are implemented to ensure that the remote users "virtual PC" is kept secure). The keyboard/mouse unit 29 sends control data to the server computing system 1 via the remote unit 2, to control the PC applications and video (and possibly

10 audio and possibly other data signals) are transmitted from the server computing system 1 to the TV 9 (a computer monitor may also be provided at the remote user end. The keyboard/mouse unit 29 also controls Internet applications access provided by the system.

15

Driven by system

The following controller units take input from the server computing system 1 via the remote unit 2 to control systems within the house.

20

IR Emitters

These are small devices which receive wireless signals from the remote unit 2 and translate them into user device specific infra-red signals. They include an

25 IR emitter which will be mounted to point at the IR receiver of the in-house device. In this way it is possible for the system to control such things as televisions and adjust their volume so that total control of the entertainment systems of the house can be achieved

30 through the controller units.

Note: There may also or alternatively be a wired version of these type of controller units.

Devices with built in controller receivers

35 Manufacturers of household equipment may build in controller receivers which are capable of taking control signals wirelessly from the system. Thus it will be

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possible for the system to control devices within the house either automatically or through manual control inputs from the client. Any devices may be controlled this way, including microwaves, cookers, and other 5 domestic devices.

Two way

In addition, some controller units will carry on two way communication with the system.

10

Phone handset 30

This is a device which looks like a wireless phone handset. It has all the usual buttons, a speaker and a microphone. It feeds back to the remote unit 2 control 15 signals as the buttons are pushed. When a phone connection is made, the remote unit 2 will forward all sound received by the microphone digitally to the server computing system 1. It also feeds back the voice signal from the server computing system 1 to the phone handset 20 controller to be converted to sound and emitted from the speaker.

Note: to the phone handset controller 30 and remote unit 2, the conversation is simply a two way transmission of sounds, only at the server computing system 1 end is 25 the activity treated as a phone call.

Applications

In this section are described some of the applications possible with the system and how the 30 components interact to provide the service.

TV

A continuous feed from a TV content provider is received at a central point in the system WAN. The signal 35 can be in many forms including:

- digital feed over the Internet;
- digital feed from TV station;

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- analogue feed from TV station to be converted to digital by the receiving server computing device 1. The digital form of the signal is multicast through the WAN to all servers with remote users who want to watch it.

5 The remote user calls up a TV station through their remote control 27. The signal from the remote 27 is received by the remote unit 2 and transferred to the server computing system 1. Alternatively an HTML or a WAP 10 command can be used to initiate the call. The server computing system 1 reacts by pumping the video of the TV channel down the client's TV channel (and also the audio).

Radio

15 The process of providing the equivalent of radio is similar to that of TV except that it is only audio and the hi-fi audio channel is used.

Video on demand

20 Video servers are placed in a central point on the WAN as well as possibly residing in the exchanges. Their content is fed to them digitally via the WAN on a periodic basis. The server computing system 1 allows for selection of a video through an HTML or WAP session. Alternatively, 25 the remote user can select a video through the remote control with command menus displayed on the television.

Once a video has been selected, the server computing system 1 starts streaming the video to the remote user end through their video channel. The remote user controls the 30 playing using the remote control 27 allowing stop, rewind, etc. These signals are received by the remote unit 2 and piped straight through to the server computing system 1 which adjusts the playing of the video accordingly.

Audio on demand

The process of providing the audio on demand is similar to video on demand except that it is only audio

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) and the hi-fi audio channel is used.

Phone call

- The remote user makes phone calls using the special phone handset. The sequence of events is:
1. The remote user presses the "On" or "Off hook" button;
 2. The signal is received by the remote unit 2 and piped through to the server computing system 1 which initiates a phone call via its link to a Telco network 5.
 3. The server computing system 1 also activates one incoming and one outgoing voice quality audio channel to the client's remote unit 2. The remote unit 2 then passes these on wirelessly to drive the speaker and microphone of the phone handset 30.
 4. The client dials the number.
 5. The remote unit 2 relays the number to the server computing system 1 which uses them to connect the call.
 6. Once the call is connected, all incoming sound is relayed to the remote user's phone speaker and all sound at the remote user's end is received by the phone microphone and passed down the line to the phone connection.
 7. As the conversation goes on, control input is also possible through the phone handset 30 or through HTML or WAP to perform actions on the connection such as transferring, conference calling, etc. These signals are passed through the server computing system 1 which carries out the requests.
 8. When the remote user hangs up, the phone call is terminated and the voice and control channels are deactivated.

() Video-conferencing

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Video conferencing is achieved in a similar fashion to a phone call except a video camera 31 feeding the incoming video channel is involved. The connection is still controlled from the phone handset 30 or HTML or WAP.

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Personal computing

To use the system as a personal computer, the client activates the wireless keyboard and mouse 29. The remote unit 2 passes all input from these devices onto the server 10 computing system 1 which initiates a session as an application service provider of the remote user's operating system, applications and disk storage space. Display responses are fed down the video channel to appear on the remote user's TV.

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Internet access

The process of accessing the Internet is similar to that of personal computing. It happens through the keyboard and mouse as input and the TV as output. Internet 20 browsing and email are simply additional applications ASPed by the server computing device 1.

Games

When the client activates the games control unit 28 a 25 game session for the remote user is activated on the server computing device 1. A continuous stream of control input from the game control unit 28 is relayed via the remote unit 2 to the server computing system 1 and the game display appears on the TV 9 via the video channel.

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The games provided by the server computing system 1 can either be played independently or interactively with others on the system network or Internet via the links from the system server network.

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Remote control of house systems

A series of systems 12 within the house may be connected to the system through controller devices in the

) form of IR emitters, built in chips or standard protocols such as X10. These then receive commands wirelessly from the remote unit 2 which is relaying the commands from server computing system 1. These commands can be 5 initiated through the remote control, an HTML or WAP session.

10 The communication with the house systems may be two way and a user may be able to receive a status report of their house systems, over the Internet in the form of a web page, for example.

15 Note that where this specification refers to the Internet, any other suitable public access network could be used.

20 The remote unit of the above described embodiment includes only processing means enabling format conversion, and no decision making processing means. In other embodiments, however, some decision making processing may be included or some ancillary processing (e.g. for driving displays on the remote unit).

25 Note that, although the above described embodiment relates to providing communications services to the home, the system of the present invention could provide communications services anywhere, including to the business environment.

30 In the above embodiment, a plurality of communications services are able to be transmitted to the user. The present invention is not limited to providing a plurality of communications services. In one aspect, only a single communications service may be provided.

35 In the above embodiment, the communications services are transmitted by a broadband link. The present invention is not limited to using broadband. A narrowband communications link may also be used, particularly for communications services where it would be sufficient.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments

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) without departing from the spirit or scope of the
invention as broadly described. The present embodiments
are, therefore, to be considered in all respects as
illustrative and not restrictive.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. A system for providing a plurality of communication services to a remote user, comprising a server computing system including processing means for processing a plurality of communications services and transmission means for providing the communications services over a transmission link, and a remote unit located remotely from the server computing system and including receiving means arranged to receive the communications services over the transmission link and pass the communications services to remote user devices, and transmitting means for transmitting control signals for controlling and selecting communications services to the server computing system over the transmission link, wherein processing of the control signals and consequent control and selection of the communications services takes place at the server computing system, not at the remote device.
2. A system in accordance with claim 1, wherein the communications services include two or more of; TV; video; radio; computing services; video games services; telephone; video conferencing; IP based data services, and audio.
3. A system in accordance with claim 1 or claim 2, wherein all decision making processing is carried out by the server computing system, not by the remote unit.
4. A system in accordance with any one of the preceding claims, wherein the transmission link is a broadband link.
5. A system in accordance with any one of the preceding claims, wherein the remote unit is located at a domestic location.
6. A system in accordance with any one of the preceding claims, wherein the remote unit is located at a business location.
- 35 7. A system in accordance with any one of the preceding

- 27 -

claims, further comprising a control unit for use by the remote user, and arranged to generate control signals for transmission to the server computing system via the remote unit.

- 5 8. A system in accordance with claim 7 wherein the control unit includes one or more of the following: a phone handset for providing telephone signals as control signals; a games controller for generating control signals for controlling video games, a remote control unit for 10 generating signals for controlling video games; a video camera for generating video signals at the remote user end, and a keyboard/mouse unit for generating control signals for controlling a computing communications service.
- 15 9. A system in accordance with any one of the preceding claims, further comprising a controller unit for controlling remote user devices in response to signals generated by the server computing system.
10. A system in accordance with claim 9, wherein the 20 controller unit comprises one or more of the following: a controller unit for controlling a domestic device; a telephone handset unit.
11. A system in accordance with any one of the preceding claims, wherein the link to the Internet is provided to 25 enable access to the Internet via the remote unit.
12. A system in accordance with any one of the preceding claims, wherein a link to a telecommunications provider is provided to enable telephony services to be provided.
13. A system in accordance with claim 12, wherein the 30 server computing system is configured to respond to control signals provided via the Internet connection in order to control and select communications services to be provided to the remote unit.
14. A system for providing a communication service to a 35 remote user, comprising a server computing system

- including processing means for processing the communications service and transmission means for transmitting the communication service over a transmission link, and a remote unit located remotely from the server
- 5 computing system and including receiving means arranged to receive the communications service over the transmission link and pass the communications service to remote user devices, and transmitting means for transmitting control signals for controlling the communications service to the
- 10 server computing system over the transmission link, wherein processing of the control signals and consequent control of the communications service takes place at the server computing system, not at the remote device.
15. A system for providing a plurality of communications services to a remote user, comprising a server computing system including processing means for processing a plurality of communications services and transmission means for transmitting communications services over a transmission link, and a remote unit located remotely from
- 20 the server computing system and including receiving means arranged to receive the communications services over the transmission link and pass the communications services to remote user devices.
16. A system for remotely controlling domestic devices, comprising a server computing system including processing means for processing instructions for controlling domestic devices; transmission means for transmitting control instructions for controlling domestic devices over a transmission link, at least one controller device
- 25 associated with a domestic device and being arranged to cause control of the domestic device in accordance with the control instructions, and a remote unit located remotely from the server computing system and including receiving means arranged to receive the control
- 30 instructions over the transmission link and pass the
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- communications services to remote user devices.
17. A system for providing a communications service to a remote user, comprising a server computing system including processing means for processing the
- 5 communications service and transmission means for providing the communications service over a transmission link, and a remote unit located remotely from the server computing system and including a receiving means arranged to receive the communications service over the
- 10 transmission link and pass the communications service to a remote user device, wherein all or the majority decision making processing occurs at the server computing system, and not at the remote unit.
18. A system in accordance with claim 17, wherein the
- 15 remote unit is arranged to carry out signal format conversion.
19. A system in accordance with claim 18, wherein the remote unit is arranged to carry out format conversion only.
20. A system in accordance with claim 17, 18 or 19, being arranged to provide a plurality of communications services.
21. A method of providing a communications service to a remote user, comprising the steps of providing the
- 25 communications service to the remote user over a transmission link from a location remote from the remote user, and carrying out all decision making processing relating to generation of the communications service at the remote location.
- 30 22. A method in accordance with claim 21, further including the step of carrying out a signal format conversion for the communications service at the remote user end.
23. A method in accordance with claim 21 or claim 22,
- 35 including the step of providing a plurality of

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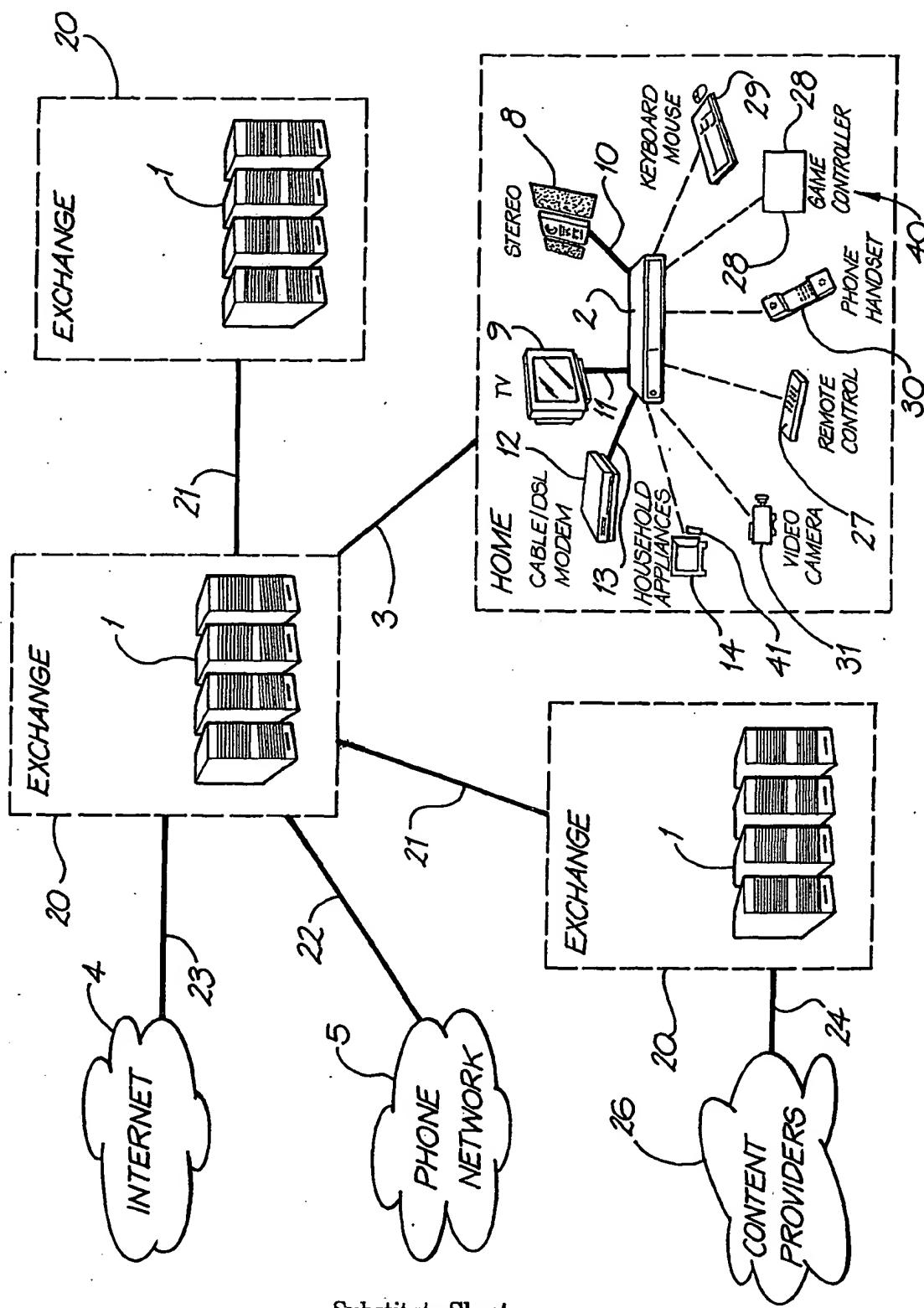
) communications services.

24. A system for providing a plurality of communication services to homes or businesses, comprising a server computing system located remotely from the homes or 5 businesses and including processing means for processing a plurality of communications services and transmission means for providing the communications services to the homes or businesses over a transmission link, and a remote unit(s) located remotely from the server computing system 10 at the homes or businesses and being arranged to operate as a port to pass communications services and control signals for controlling communications services between the remote server and remote user devices in the homes or businesses, the remote unit, as a port, including minimal 15 decision making processing.

25. A system in accordance with claim 24, wherein the communications services include two or more of; TV; video; radio; computing services; video games services; telephone; video conferencing; IP based data services, and 20 audio.

26. A system in accordance with claim 24 or claim 25, wherein all decision making processing is carried out by the server computing system, not by the remote unit.

27. A system for controlling user devices remotely, a 25 system comprising a server computing system including processing means for processing control signals from the user, and transmission means for transmitting a control signal over a transmission link to the remote user devices, the server computing system being connected to a 30 computing network whereby the user can provide control signals to the server computing system via the computing network for controlling the remote user devices.



INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU01/00486

A. CLASSIFICATION OF SUBJECT MATTER		
Int Cl ⁷ : E04N 7/173		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC: GLOBAL		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched INTERNET		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WPAT		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X A	US 5968118A (SUTTON, JR) 19 October 1999 Whole Document	15-23, 27 1-14, 24-26
X A	WO 99/49680A1 (BELLSOUTH INTELLECTUAL PROPERTY CORPORATION) 30 September 1999 Whole Document	15-23, 27 1-14, 24-26
X A	US 5625864A (BUDOW et al) 29 April 1997 Whole Document	15-23, 27 1-14, 24-26
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C		<input checked="" type="checkbox"/> See patent family annex
* Special categories of cited documents: "A" Document defining the general state of the art which is not considered to be of particular relevance "B" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed		"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family
Date of the actual completion of the international search 25 July 2001	Date of mailing of the international search report 7 August 2001	
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200 WODEN ACT 2606 AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No.: (02) 6285 3929	Authorized officer SUSHIL AGGARWAL Telephone No.: (02) 6283 2192	

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU01/00486

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5613190A (HYLTON) 18 March 1997 Whole Document	15-23, 27 1-14, 24-26
A	GB 2279832A (LINK RESEARCH LIMITED) 11 January 1995 Whole Document	15-23, 27 1-14, 24-26